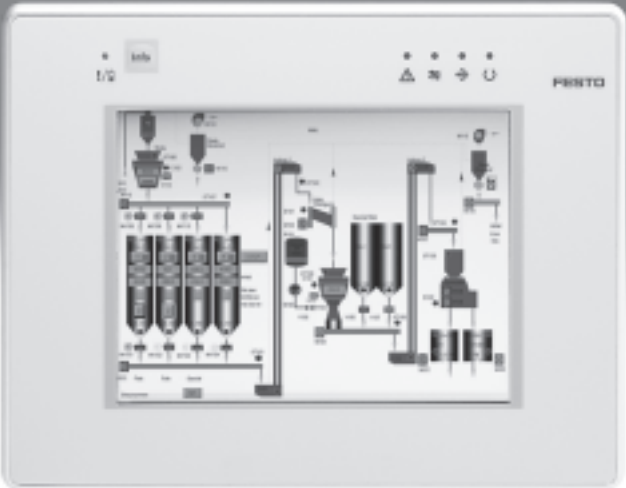


Operator units FED



Operator units FED

Key features

FESTO

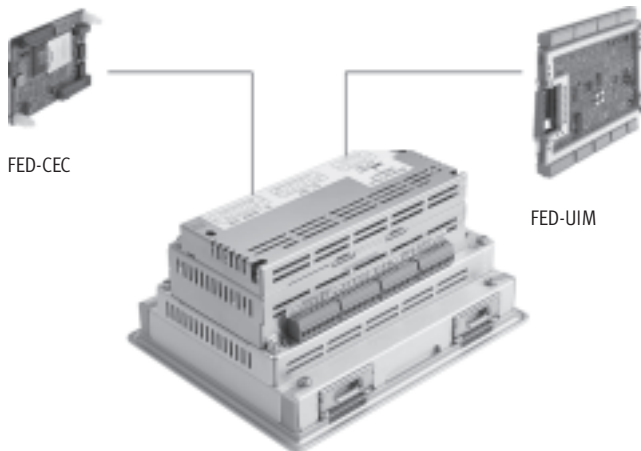
Multifunctional in use			
FED human-machine interfaces simplify the control of automation tasks at field level and set new standards in functionality and integration.	Whether for single or multi-axis control systems in handling technology or process automation, the Front End Display FED is the optimum solution.	FED-40 ... FED-90: The semi-graphical display of process values makes them easier to read. Straightforward designing of human-machine dialogues using the FED Designer programming tool supplied.	FED-301 ... FED-5000: Graphics-capable for maximum flexibility when displaying processes and data. Straightforward designing of human-machine dialogues using the FED Designer programming tool supplied. With integrated web features that support the use of standards.
Text-based Front End Displays FED-40 ... FED-90			
The FED-40 and FED-60 versions complement the proven FED-50 and FED-90 for simple dialogues using 4-line text display and operating buttons whether via a serial, fieldbus or Ethernet connection – the text panels of the FED series are 100% compatible with Festo controllers.	The following functionalities are available depending on the version: <ul style="list-style-type: none"> Serial interface (FED-40 to FED-90), optional Ethernet for use in a network (not with FED-40) Battery backup of the alarm and event data (not with FED-40) FED Designer graphical design tool included 	<ul style="list-style-type: none"> No parameterisation required; the software contains the controller data and detects the display Simple graphics possible, enabling scalable font size and simple representation of pictograms and bar charts Software for uploading projects Recipe handling Simple data acquisition 	<ul style="list-style-type: none"> Generous program memory Real-time clock (not with FED-40) Printer port (FED-90) Password protection Alarm handling Keypad can be easily programmed using macros Multilingual projects possible Import and export of texts for translation
FED-40: the entry-level model	FED-50: fieldbus-capable	FED-60: 10-key pad included	FED-90: all-inclusive
A serial connection is established with the controller. Operation is by means of four freely programmable function keys and seven system keys.	The FED-50 offers the functions of the FED-40 and can additionally be extended with an Ethernet or fieldbus interface. A real-time clock is standard on the FED-50 and higher.	In addition to the function and system keys, the FED-60 also features a 10-key pad. The real-time clock is also standard and a fieldbus interface can be optionally retrofitted.	Because of its larger size in comparison with the FED-60, the FED-90 can offer 12 function keys and 23 system keys. A printer interface permits direct output of the alarm and/or event list.
Front End Displays with touchscreen FED-301 to FED-5000			
The touchscreen displays FED-301 to FED-5000 with graphical user interface extend the proven text-based and key pad-equipped Front End	Displays FED-40 to FED-9 to include touch-sensitive displays in sizes from 3.8" to 15". As alternatives to CPX handhelds and integrated displays,	these Front End Displays provide a freely definable user interface. As a client/server system, the terminal receives data from web servers	connected to it and displays this data using the integrated browser functionality.

Operator units FED

Key features

FESTO

FED-CEC with CoDeSys software platform



CoDeSys makes your life easier with simple commissioning, fast programming and parameterisation – standardised programming of embedded devices to IEC 61131-3.

- Hardware-neutral software platform for quick and easy configuration, programming and commissioning of pneumatic and electric automation solutions.
- Extensive module libraries for single or multi-axis positioning motions.

- The IEC 61131-3 standard means that CoDeSys is flexible and open for all types of control tasks.
- Extremely flexible and modular: offline and online functions, as well as components for hardware configuration and visualisation. User-friendly IEC functional module extension.
- Re-use of existing application parts.

Functions

- Can be connected to all FEC® and CoDeSys controllers from Festo, serially or via Ethernet
- Trend display
- Recipe handling
- Multilingual projects and language changeover during runtime
- Software enables uploading of projects
- Import and export of texts for translation

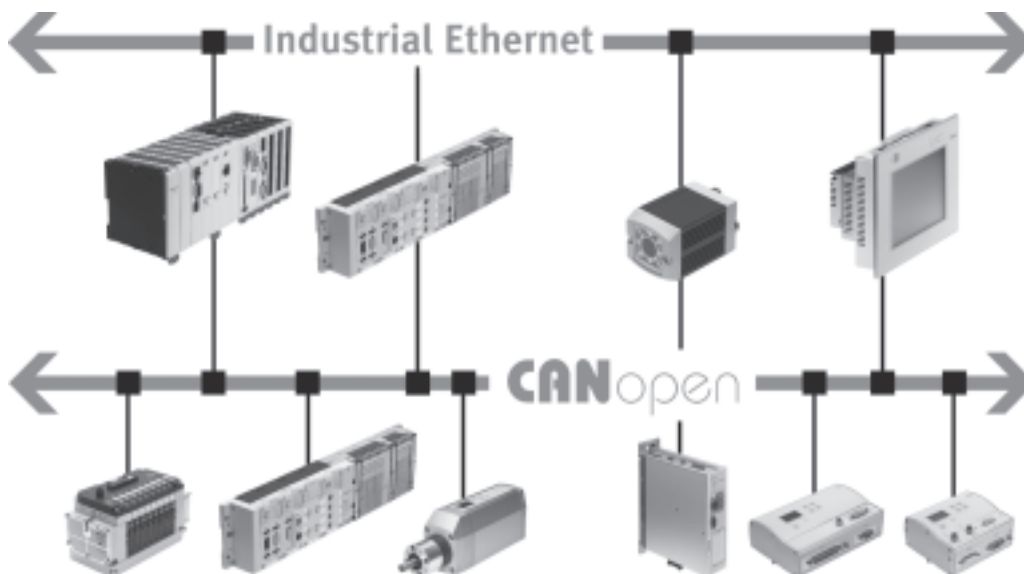
Designing

Straightforward designing and programming with the programming tool CoDeSys provided by Festo and FED Designer.

Key features at a glance

- Convenient FED Designer WYSIWYG design tool.
- No duplicate work thanks to import of variable declarations (allocation list) from the control software.
- Can also be used with Festo FEC® and CoDeSys controllers from Festo in a network by means of Ethernet.
- Graphics capability offers maximum flexibility when displaying processes and data.
- Shorter design times thanks to reusability of objects (libraries containing graphical elements).
- Generous memory means almost unlimited numbers of graphics and texts can be displayed.
- Display of complex processes is possible thanks to an unlimited number of variables per page.
- Extremely sturdy thanks to a metal housing to facilitate use in tough environments.

The Front End Displays in the Festo controller landscape



Operator units FED

Product range overview, type codes

FESTO

Type	Display resolution	Number of colours	Display size	Interfaces	→ Page/Internet
Text-based					
FED-40	120x32 pixels	B/W	4x20 characters	PLC, PC	5
FED-50				PLC, PC, Ethernet ¹⁾	
FED-60				PLC, PC, Ethernet ¹⁾	
FED-90				PLC, PC, printer, Ethernet ¹⁾	
Touch screen					
FED-301	1/4 VGA, 320x240 pixels	B/W	3.8”	PLC, PC, Ethernet ¹⁾	8
FED-400	480x272 pixels	256	4.3”	PLC, PC, Ethernet ²⁾	
FED-501	1/4 VGA, 320x240 pixels	8 grey scales	5.6”	PLC, PC, printer, Ethernet ¹⁾	
FED-550		64 k	5.7”	PLC, PC, printer, Ethernet ³⁾	
FED-700	VGA, 640x480 pixels	64 k	7.5”	PLC, PC, printer, Ethernet ⁴⁾	
FED-1000			10.4”		
FED-2000	SVGA, 800x600 pixels	64 k	12.1”	PLC, PC, printer, Ethernet ⁴⁾	
FED-5000	XGA, 1024x768 pixels	64 k	15”		

1) 10 MBd optional

2) 100 MBd

3) 10/100 MBd standard

4) 10/100 MBd standard, 2nd 10 MBd interface optional

Type codes

		FED	–	2000
Function				
FED	Teach pendant			
Display size, equipment				
Text-based				
40	4 x 20 characters			
50	Equipment details ➔ Product range overview and Technical data			
60				
90				
Touch screen				
301	3.8", B/W			
400	4.3", 256 colours			
501	5.6", 8 grey scales			
550	5.7", 64 k colours			
700	7.5", 64 k colours			
1000	10.4", 64 k colours			
2000	12.1", 64 k colours			
5000	15", 64 k colours			

Operator units FED, text-based

FESTO

Technical data

Voltage

18 ... 30 V DC

Temperature range

0 ... +50 °C



General technical data				
	FED-40	FED-50	FED-60	FED-90
Display	Monochrome LCD with backlighting			
Display size	4x20 characters			
Display resolution	120x32 pixels			
Number of colours	–			
Number of function keys	4	4	9	12
Number of system keys	7	7	10	23
Number of user LEDs	5	5	10	13
Number of system LEDs	4	4	4	4
User memory	512 KB			
Recipe memory	–	16 KB	16 KB	16 KB
Event lists	–	256	256	256
Alerts	1,024			
Type of mounting	Front panel mounting			
Installation depth [mm]	53	53	53	71
Max. front panel thickness [mm]	5			

Electrical data				
	FED-40	FED-50	FED-60	FED-90
Nominal operating voltage DC [V]	24			
Operating voltage range DC [V]	18 ... 30			
Current consumption at nominal operating voltage [A]	0.25			0.3
AUX interface	–	Sub-D socket, 9-pin		
Printer interface	–	–	–	Sub-D socket, 15-pin, RS232
Ethernet interface	–	Optional, 10 MBd		
PC interface	Sub-D plug, 15-pin, RS232			Sub-D socket, 15-pin, RS232
Programming interface	9.6 kBd	9.6 ... 38.4 kBd		
Programming software	FED Designer 6.06 or higher			
PLC interface	Sub-D plug, 15-pin, RS232			
Backup battery	–	3 V/270 mA lithium		
Real-time clock	–	Yes		
Real-time clock deviation	–	130 s/month		
Protection class	IP65 at the front following installation into control panel, IP20 at the back			

Operator units FED, text-based

Technical data

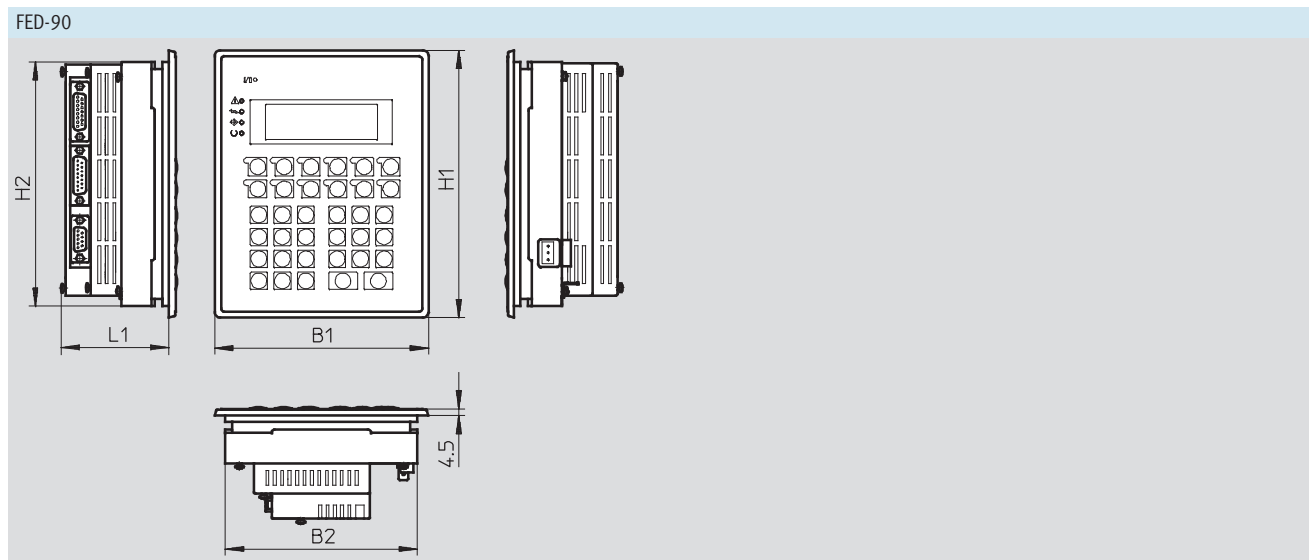
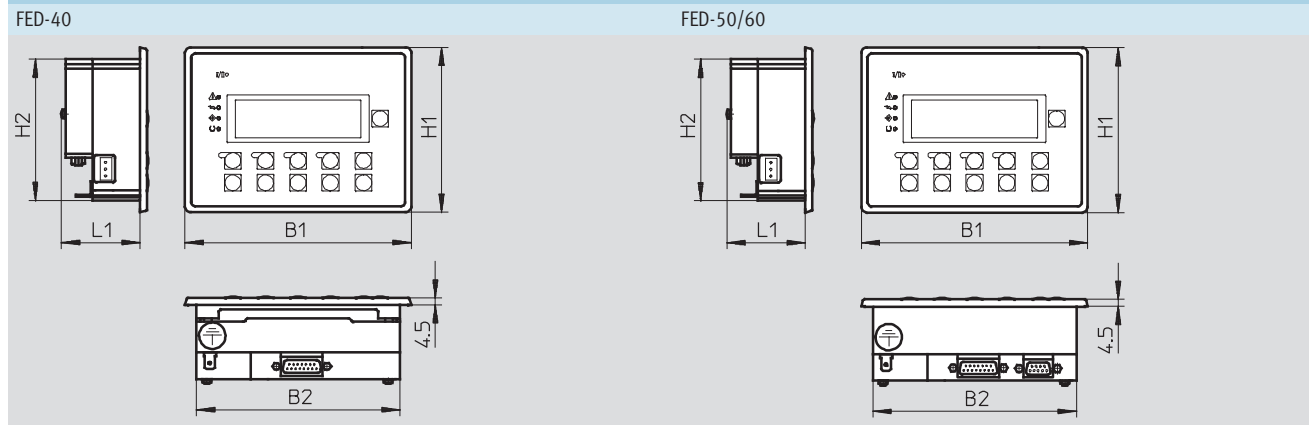
FESTO

Operating and environmental conditions		
Ambient temperature	[°C]	0 ... +50
Storage temperature	[°C]	−20 ... +70
Relative air humidity	[%]	5 ... 85, non-condensing
CE mark (see declaration of conformity)		To EU EMC Directive ¹⁾
Certification		C-Tick
Ex certification to NEC 500		Class I, Division 2, Groups A, B, C and D

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com → Support → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Weight [g]					
		FED-40	FED-50	FED-60	FED-90
Product weight	[g]	1,000	1,000	1,000	1,100

Dimensions Download CAD Data → www.festo.com/us/cad



Type	B1	B2	H1	H2	L1
FED-40	149	134	108.5	93.5	52.5
FED-50					
FED-60					
FED-90	140.6	126.6	176	161	71

Operator units FED, text-based

Technical data



Ordering data						
Display resolution	Number of colours	Display size	Interfaces	Number of function/system keys	Part No.	Type
120x32 pixels	B/W	4x20 characters	PLC, PC	4/7	541998	FED-40
			PLC, PC, Ethernet ¹⁾	4/7	533531	FED-50
			PLC, PC, Ethernet ¹⁾	9/10	541999	FED-60
			PLC, PC, printer, Ethernet ¹⁾	12/23	533532	FED-90

1) 10 MBd optional

Operator units FED, touch screen

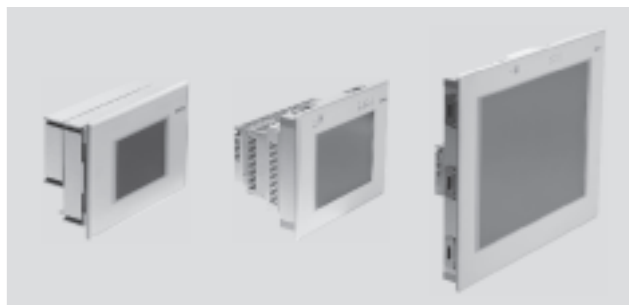
Technical data

Voltage

18 ... 30 V DC

Temperature range

0 ... +50 °C



General technical data					
	FED-301	FED-400	FED-501	FED-550	FED-700
Display properties	Touch screen				
Display	Monochrome LCD	Colour TFT	Monochrome LCD	Colour TFT	Colour TFT
Display size	3.8"	4.3"	5.6"	5.7"	7.5"
Display resolution	1/4 VGA, 320x240 pixels	480x272 pixels	1/4 VGA, 320x240 pixels	1/4 VGA, 320x240 pixels	VGA, 640x480 pixels
Number of colours	B/W	256	8 grey scales	64 k	64 k
Number of function keys	–		1		
Number of user LEDs	–		1		
Number of system LEDs	4	–	4		
User memory	512 KB	2 MB	32 MB	64 MB	32 MB
Recipe memory	32 KB				
Event lists	256		1,024		
Alerts	1,024				
Type of mounting	Front panel mounting				
Installation depth [mm]	61	56	66	91	71
Max. front panel thickness [mm]	5				
Materials					
Note on materials	RoHS-compliant				

	FED-770	FED-1000	FED-2000	FED-3000	FED-5000
Display properties	Touch screen				
Display	Colour TFT				
Display size	7"	10.4"	12.1"	13.3"	15"
Display resolution	WVGA, 800x480 pixels	VGA, 640x480 pixels	SVGA, 800x600 pixels	WXGA, 1280x800 pixels	XGA, 1024x768 pixels
Number of colours	64 k				
Number of function keys	1				
Number of user LEDs	1				
Number of system LEDs	4				
User memory	64 MB	32 MB	32 MB	64 MB	32 MB
Recipe memory	32 KB				
Event lists	1,024				
Alerts	1,024				
Type of mounting	Front panel mounting				
Installation depth [mm]	45	91	91	42	101
Max. front panel thickness [mm]	4	5	5	4	5
Materials					
Note on materials	RoHS-compliant				

Operator units FED, touch screen

Technical data

Electrical data						
	FED-301	FED-400	FED-501	FED-550	FED-700	
Nominal operating voltage DC [V]	24					
Operating voltage range DC [V]	18 ... 30					
Current consumption at nominal operating voltage [A]	0.4		0.6	1	1.1	
AUX interface	Sub-D socket, 9-pin					
Printer interface	–		Sub-D socket, 15-pin, RS232			
Ethernet interface	Optional, 10 MBd	100 MBd	Optional, 10 MBd	RJ45 10/100 MBd		
PC interface	Sub-D plug, 15-pin, RS232		Sub-D socket, 15-pin, RS232			
Programming interface	9.6 ... 38.4 kBd					
Programming software	FED Designer 6.06 or higher	FED Designer 6.09 or higher	FED Designer 6.06 or higher	FED Designer 6.09 or higher	FED Designer 6.06 or higher	
PLC interface	Sub-D plug, 15-pin, RS232					
Backup battery	3 V/270 mA lithium					
Real-time clock	Yes					
Real-time clock deviation	130 s/month					
Protection class	IP65 at the front following installation into control panel, IP20 at the back					

	FED-770	FED-1000	FED-2000	FED-3000	FED-5000
Nominal operating voltage DC [V]	24				
Operating voltage range DC [V]	18 ... 30				
Current consumption at nominal operating voltage [A]	0.6	1.2	1.3	1.4	1.5
AUX interface	Sub-D socket, 9-pin				
Printer interface	Sub-D socket, 15-pin, RS232				
Ethernet interface	RJ45 10/100 MBd				
	2nd Ethernet interface optional, 10 MBd				
PC interface	Sub-D socket, 15-pin, RS232				
USB interface	Yes	–	–	Yes	–
Programming interface	9.6 ... 38.4 kBd				
Programming software	FED Designer 6.06 or higher				
PLC interface	Sub-D plug, 9-pin, RS232, RS485	Sub-D plug, 15-pin, RS232		Sub-D plug, 9-pin, RS232, RS485	Sub-D plug, 15-pin, RS232
Backup battery	Lithium, rechargeable	3 V/270 mA lithium		Lithium, rechargeable	3 V/270 mA lithium
Real-time clock	Yes				
Real-time clock deviation	130 s/month				
Protection class	IP65 at the front following installation into control panel, IP20 at the back				

Operator units FED, touch screen

Technical data

FESTO

Operating and environmental conditions					
	FED-301	FED-400	FED-501	FED-550	FED-700
Ambient temperature [°C]	0 ... +50		0 ... +50	0 ... +45	0 ... +45
Storage temperature [°C]	-20 ... +70				
Relative air humidity [%]	5 ... 85, non-condensing				
CE mark (see declaration of conformity)	To EU EMC Directive ¹⁾				
Certification	cULus listed (OL)	–	–	–	cULus listed (OL)
	C-Tick	–	C-Tick	–	–
Ex certification to NEC 500	–		Class I, Division 2, Groups A, B, C and D	–	–

	FED-770	FED-1000	FED-2000	FED-3000	FED-5000
Ambient temperature [°C]	0 ... +50	0 ... +45	0 ... +45	0 ... +50	0 ... +45
Storage temperature [°C]	-20 ... +70				
Relative air humidity [%]	5 ... 85, non-condensing				
CE mark (see declaration of conformity)	To EU EMC Directive ¹⁾				
Certification	cULus listed (OL)	–	–	cULus listed (OL)	cULus listed (OL)
	C-Tick	C-Tick	C-Tick	C-Tick	C-Tick
Ex certification to NEC 500	–	Class I, Division 2, Groups A, B, C and D		–	–

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com → Support → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

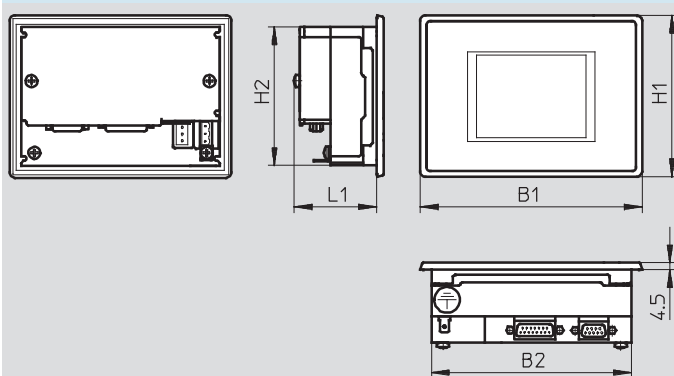
Weight [g]					
	FED-301	FED-400	FED-501	FED-550	FED-700
Product weight [g]	1,000	1,000	1,400	1,400	1,600

	FED-770	FED-1000	FED-2000	FED-3000	FED-5000
Product weight [g]	1,000	2,300	2,800	2,500	3,800

Dimensions

Download CAD Data → www.festo.com/us/cad

FED-301/400



Type	B1	B2	H1	H2	L1
FED-301	149	134	108.5	93.5	60.5
FED-400	149	136	109	96	56

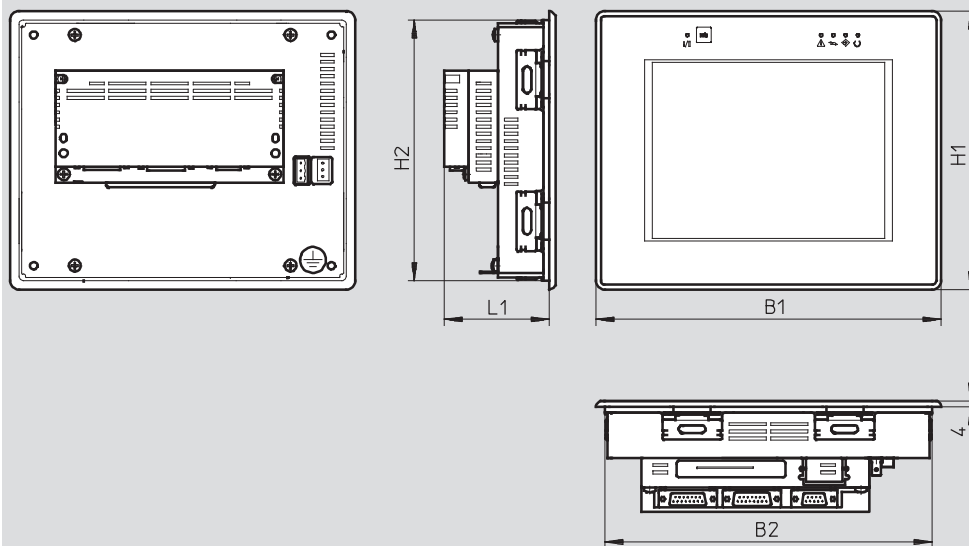
Operator units FED, touch screen

Technical data

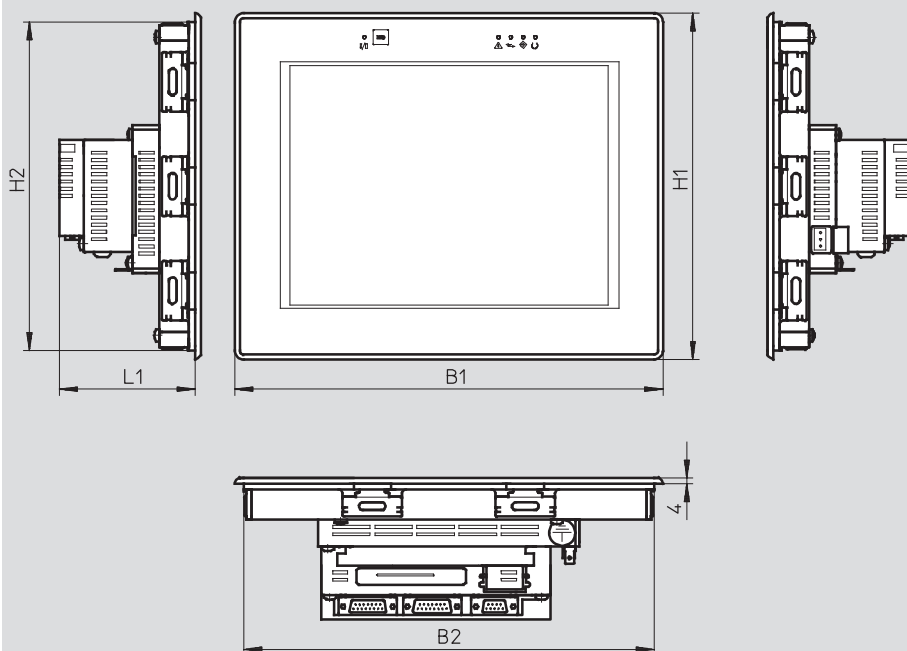
Dimensions

Download CAD Data → www.festo.com/us/cad

FED-700/770/3000



FED-501/550/1000/2000/5000





Type	B1	B2	H1	H2	L1	L2
FED-501	187	175	147	135	66	4
FED-550	187	176	147	136	91	4
FED-700	232	220	187	175	71	4
FED-770	187	175	147	135	45	4
FED-1000	287	275	232	220	91	4
FED-2000	337	325	267	255	91	4
FED-3000	337	325	267	255	41.5	4
FED-5000	392	380	307	295	101	4

Operator units FED, touch screen

Technical data

FESTO

Ordering data						
Display resolution	Number of colours	Display size	Interfaces	Number of function/ system keys	Part No.	Type
1/4 VGA, 320x240 pixels	B/W	3.8"	PLC, PC, Ethernet ¹⁾	-/-	543438	FED-301
480x272 pixels	256	4.3"	PLC, PC, Ethernet ²⁾	-/-	570864	FED-400
1/4 VGA, 320x240 pixels	8 grey scales	5.6"	PLC, PC, printer, Ethernet ¹⁾	1/-	543440	FED-501
	64 k	5.7"	PLC, PC, printer, Ethernet ³⁾	1/-	570398	FED-550
VGA, 640x480 pixels	64 k	7.5"	PLC, PC, printer, Ethernet ⁴⁾	1/-	543442	FED-700
WVGA, 800x480 pixels	64 k	7"	PLC, PC, printer, Ethernet ³⁾	-/-	573905	FED-770 
VGA, 640x480 pixels	64 k	10.4"	PLC, PC, printer, Ethernet ⁴⁾	1/-	543515	FED-1000
SVGA, 800x600 pixels	64 k	12.1"	PLC, PC, printer, Ethernet ⁴⁾	1/-	543444	FED-2000
WXGA, 1280x800 pixels	64 k	13.3"	PLC, PC, printer, Ethernet ³⁾	-/-	573906	FED-3000 
XGA, 1024x768 pixels	64 k	15"	PLC, PC, printer, Ethernet ⁴⁾	1/-	543447	FED-5000

1) 10 MBd optional

2) 100 MBd

3) 10/100 MBd standard

4) 10/100 MBd standard, 2nd 10 MBd interface optional

Operator units FED, embedded control

Accessories

Controller

Plug-in card with processor module for installation in the operator units FED-50 to FED-5000.

Fieldbus interfaces

CANopen

Controller FED-CECCAN

Plug-in card with processor module for installation in the operator units FED-400, FED-550, FED-700, FED-1000, FED-2000 and FED-5000.



General technical data		
	FED-CEC	FED-CECCAN
CPU data	32-bit RISC processor, 24 MHz	
	Watchdog	
Programming software	CoDeSys provided by Festo	
Programming language	SFC, IL, FCH, LD and ST to IEC 61131-3	
	Additionally CFC	
Ethernet		
Connector plug	RJ45	
Number	1	
Transmission speed	[Mbps] 10	10/100
Supported protocols	TCP/IP	
	EasyIP	
Fieldbus interface		
Type	CAN	
Connection technology	Sub-D plug, 9-pin	
Transmission rate	Max. 1 Mbps, adjustable	
Materials		
Note on materials	Contains PWIS (paint-wetting impairment substances)	
	–	RoHS-compliant

Operating and environmental conditions		
Ambient temperature [°C]	0 ... +50	
Storage temperature [°C]	–20 ... +70	
Relative air humidity [%]	5 ... 85 (non-condensing)	
CE mark (see declaration of conformity)	To EU EMC Directive ¹⁾	

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com → Support → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Ordering data		
	Part No.	Type
Controller	559869	FED-CEC
	570400	FED-CECCAN

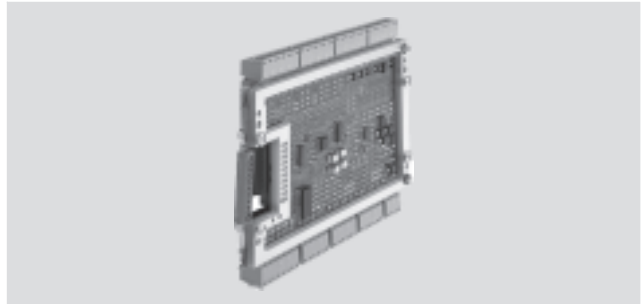
Operator units FED, embedded control

Accessories

FESTO

I/O module FED-UIM

Plug-in card for installation in the operator units FED-550, FED-1000, FED-2000 and FED-5000.



General technical data		
Analogue inputs		
Number		8
Resolution	[bit]	12
Signal range	[V]	0 ... 10
	[V]	±10
	[V]	0 ... 5
	[V]	±5
	[V]	0 ... 1
	[V]	±1
	[mA]	0 ... 20
	[mA]	4 ... 20
		PT 100 (−100 ... +850 °C)
		Thermoelement E, J, K, R, S, T
Absolute accuracy at 25 °C	[%]	0.1
Linearity error at 25 °C	[%]	0.1
Input resistance	[Ω]	47
Analogue outputs		
Number		4
Resolution	[bit]	12
Max. load resistance	[Ω]	470
Signal range	[V]	±10
Linearity error at 25 °C	[%]	±0.15 voltage output
	[%]	±0.2 current output
Digital inputs		
Number		20
Fast clock pulse inputs		4
Incremental encoder connection		4
Input signal delay	[ns]	200
Input voltage	[V DC]	24
Input current	[mA]	3
Input signal delay	[ms]	50
Nominal value for TRUE	[V DC]	12 ... 30
Nominal value for FALSE	[V DC]	≤ 6
Electrical isolation		Yes, via optocoupler

Operator units FED, embedded control

Accessories

FESTO

General technical data		
Digital outputs		
Number		12
Contact		Transistor
Output voltage	[V DC]	12 ... 30
Output current	[mA]	500
Electrical isolation		Yes, via optocoupler
Short circuit proof		Yes
Overload proof		Yes
Materials		
Note on materials		Contains PWIS (paint-wetting impairment substances)

Operating and environmental conditions		
Ambient temperature	[°C]	0 ... +50
Storage temperature	[°C]	−20 ... +70
Relative air humidity	[%]	5 ... 85 (non-condensing)
CE mark (see declaration of conformity)		To EU EMC Directive ¹⁾

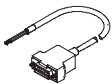
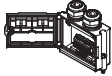
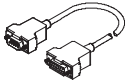
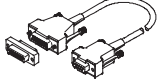
- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com → Support → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.



Ordering data		
	Part No.	Type
I/O module	559870	FED-UIM

Operator units FED

Accessories

FESTO

Ordering data – Cables and plugs					
	Description	Electrical connection	Cable length [m]	Part No.	Type
	For connecting to control block CPX-FEC Prepared for combining with plug FBS-SUB-9-GS-1X9POL-B	Open end Sub-D socket, 15-pin	5	539642	FEC-KBG7
	Suitable for control block CPX-FEC For combining with cable FEC-KBG7	Sub-D plug, 9-pin	–	534497	FBS-SUB-9-GS-1X9POL-B
	For connecting to control block CPX-FEC	Sub-D plug, 15-pin Sub-D socket, 15-pin	2.5	539643	FEC-KBG8
	Programming cable	Sub-D plug, 15-pin Sub-D socket, 15-pin	3	533534	FEDZ-PC

Ordering data				
	Description	Electrical connection	Part No.	Type
Fieldbus interface				
	Ethernet interface module (FST controller software)	Sub-D adapter, 9-pin to RJ45	533533	FEDZ-IET
	Ethernet TCP interface module (CoDeSys controller software)	Sub-D adapter, 9-pin to RJ45	543450	FEDZ-IET TCP
Memory card				
	User memory 32 MB		543514	FEDZ-MEM32

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Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 12,000 employees in 56 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

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